

CLAIM AMENDMENTS

Claim Amendment Summary

Claims pending

- Before this Amendment: Claims 1-26.
- After this Amendment: Claims 1-26.

Non-Elected, Canceled, or Withdrawn claims: None

Amended claims: 1, 2, 12, 13, and 15.

New claims: None

Claims:

1. (Currently Amended) A method of processing a composite component, comprising:

providing a lay-up mandrel having a non-planar portion;

forming a prepreg material on the non-planar portion;

partially curing the prepreg material;

~~after partially curing the prepreg material forming the prepreg material on the lay-up portion,~~ providing an elastomeric caul over the prepreg material in an initial position such that a first portion of the elastomeric caul is proximate the prepreg material on the lay-up mandrel, and a second portion of the elastomeric caul adjacent the first portion is spaced apart from the prepreg material such that a void is formed between the second portion and the prepreg material, the second

portion having a perimeter non-sealingly engaged with the lay-up mandrel;

providing a bagging film over the elastomeric caul;

sealing the bagging film to the lay-up mandrel;

applying a vacuum under the bagging film and thereby reducing a pressure between the elastomeric caul and the lay-up mandrel; and

stretching the elastomeric caul due to the pressure reduction into a second position such that the second portion of the elastomeric caul is drawn into substantially continuous engagement with at least one of the prepreg material and the lay-up mandrel.

2. (Currently Amended) The method of Claim 1, ~~wherein forming a prepreg material on the non-planar portion includes forming a partially-cured prepreg material on the non-planar portion, the method~~ further comprising, with the elastomeric caul stretched into the second position, applying at least one of an elevated temperature and an elevated pressure to the prepreg material to fully-cure the partially-cured resin of the prepreg material.

3. (Previously presented) The method of Claim 1, wherein the mandrel includes a non-planar portion, and wherein providing an elastomeric caul over the prepreg material in an initial position includes providing a stretchable elastomeric caul wherein, in a relaxed state, the elastomeric caul is not shaped to conform to the non-planar portion.

4. (Previously presented) The method of Claim 1, wherein the mandrel includes a step-shaped portion, and wherein forming a prepreg material on a mandrel includes forming a prepreg material on the step-shaped portion of the mandrel.

5. (Original) The method of Claim 4, wherein the step-shaped portion of the mandrel includes an upper step portion, a middle step portion extending downwardly from the upper step portion, and a lower step portion extending away from the middle step portion, and wherein providing an elastomeric caul over the prepreg material in an initial position includes providing the elastomeric caul over the prepreg material such that the first portion of the caul is engaged with the prepreg material on the upper step portion and the second portion of the caul extends between the upper step portion and the lower step portion.

6. (Original) The method of Claim 5, wherein providing an elastomeric caul over the prepreg material in an initial position includes providing the elastomeric caul over the prepreg material such that a third portion of the caul adjacent the second portion and opposite the second portion from the first portion is engaged with the lower step portion of the mandrel.

7. (Previously presented) The method of Claim 1, wherein providing an elastomeric caul over the prepreg material in an initial position includes securing a third portion of the elastomeric caul into a fixed position relative to the mandrel, the third portion of the caul being adjacent the second portion and spaced apart from the prepreg material, and wherein the method further comprises reducing a second pressure between the bagging film and the elastomeric caul.

8. (Original) The method of Claim 7, wherein securing a third portion of the elastomeric caul includes securing the elastomeric caul using at least one of a snap, a hook-and-loop fastener, and a clamping member.

9. (Original) The method of Claim 1, wherein reducing a pressure within a space disposed between the elastomeric caul and the mandrel includes securing a third portion of the elastomeric caul into a fixed position relative to the mandrel by reducing the pressure within the space.

10. (Original) The method of Claim 1, further comprising providing a release layer between the prepreg material and the elastomeric caul.

11. (Previously Presented) The method of Claim 1, wherein comprising providing an elastomeric caul over the prepreg material in an initial position further includes providing an elastomeric caul having a third portion adjacent the first portion and spaced apart from the prepreg material, and wherein stretching the elastomeric caul into a second position further includes stretching the elastomeric caul such that the third portion is drawn into continuous engagement with at least one of the prepreg material and the lay-up mandrel.

12. (Currently Amended) A method of manufacturing a component, comprising:

forming a composite material on a non-planar portion of a mandrel;
partially curing the composite material;

after partially curing the composite material ~~forming the composite material on the lay-up mandrel~~, providing an elastomeric caul over the composite material in an initial position such that a first portion of the elastomeric caul is proximate the composite material on the lay-up mandrel, and a second portion of the elastomeric caul adjacent the first portion is spaced apart from the composite material such that a void is formed between the second portion and

the prepreg material, the second portion having a perimeter non-sealingly engaged with the mandrel;
providing a bagging film over the elastomeric caul;
sealing the bagging film to the lay-up mandrel;
applying a vacuum under the bagging film and thereby reducing a pressure between the elastomeric caul and the lay-up mandrel;
stretching the elastomeric caul due to the pressure reduction into a second position such that the second portion of the elastomeric caul is drawn proximate to at least one of the composite material and the lay-up mandrel; and
fully-curing the partially-cured resin of the composite material with the elastomeric caul stretched into the second position.

13. (Currently Amended) The method of Claim 12, ~~wherein forming a composite material on a non-planar portion of a mandrel includes forming a partially-cured composite material on a non-planar portion of a mandrel, and~~ wherein curing the composite material includes applying at least one of an elevated temperature and an elevated pressure to the composite material.

14. (Original) The method of Claim 12, wherein providing an elastomeric caul over the composite material in an initial position includes providing a stretchable elastomeric caul wherein, in a relaxed state, the elastomeric caul is not shaped to conform to the non-planar portion.

15. (Currently Amended) The method of Claim 12, wherein forming a composite material on a non-planar portion of a mandrel includes forming a ~~partially-cured~~ the composite material on a step-shaped portion of the mandrel, the step-shaped portion having an upper step portion, a middle step portion

extending downwardly from the upper step portion, and a lower step portion extending away from the middle step portion, and wherein providing an elastomeric caul over the ~~partially-cured~~ composite material in an initial position includes providing the elastomeric caul over the ~~partially-cured~~ composite material such that the first portion of the caul is engaged with the ~~partially-cured~~ composite material on the upper step portion and the second portion of the caul extends between the upper step portion and the lower step portion.

16. (Original) The method of Claim 15, wherein providing an elastomeric caul over the composite material further includes providing the elastomeric caul over the composite material such that a third portion of the caul adjacent the second portion and opposite the second portion from the first portion is engaged with the lower step portion of the mandrel.

17. (Original) The method of Claim 12, wherein providing an elastomeric caul over the composite material in an initial position includes securing a third portion of the elastomeric caul into a fixed position relative to the mandrel, the third portion of the caul being adjacent the second portion and opposite the second portion from the first portion.

18. (Original) The method of Claim 12, wherein reducing a pressure within a space disposed between the elastomeric caul and the mandrel includes securing a third portion of the elastomeric caul into a fixed position relative to the mandrel by reducing the pressure within the space.

19. (Original) The method of Claim 12, wherein providing an elastomeric caul over the composite material in an initial position further includes providing an elastomeric caul having a third portion adjacent the first portion and spaced apart from the composite material, and wherein stretching the elastomeric caul

into a second position further includes stretching the elastomeric caul such that the third portion is drawn into continuous engagement with at least one of the composite material and the lay-up mandrel.

20. (Withdrawn) An assembly for processing a prepreg material into a composite component, comprising:
a mandrel having a non-planar portion, the mandrel being adapted to receive the prepreg material thereon; and
an elastomeric caul adapted to be positioned over at least part of the mandrel such that in an initial position, a first portion of the caul is proximate the prepreg material, and a second portion of the caul adjacent the first portion is spaced apart from the prepreg material and the mandrel, the elastomeric caul being further adapted such that when a pressure within a space disposed between the elastomeric caul and the non-planar portion of the mandrel is reduced, the elastomeric caul is stretched to a second position such that the second portion of the caul is proximate to at least one of the prepreg material and the mandrel.

21. (Withdrawn) The assembly of Claim 20, wherein the non-planar portion of the mandrel includes a step-shaped portion having an upper step portion, a middle step portion extending downwardly from the upper step portion, and a lower step portion extending away from the middle step portion.

22. (Withdrawn) The assembly of Claim 20, wherein at least one of the mandrel and the elastomeric caul includes an attachment assembly adapted to couple a third portion of the caul in a fixed position relative to the mandrel, the third portion being adjacent the second portion and opposite the second portion from the first portion.

23. (Withdrawn) The assembly of Claim 20, wherein the attachment assembly includes at least one of a snap, a hook-and-loop fastener, and a clamping member.

24. (Withdrawn) The assembly of Claim 20, further comprising a release layer disposed between the elastomeric caul and the mandrel and adapted to substantially prevent the elastomeric caul from becoming attached to the prepreg material.

25. (Withdrawn) The assembly of Claim 20, further comprising a curing apparatus adapted to apply at least one of an elevated temperature and an elevated pressure to the prepreg material.

26. (Withdrawn) The assembly of Claim 20, wherein the elastomeric caul is further adapted such that in the initial position, a third portion of the caul adjacent the first portion is spaced apart from the prepreg material and the mandrel, the elastomeric caul being further adapted such that when the pressure within the space is reduced, the third portion of the caul is proximate to at least one of the prepreg material and the mandrel.